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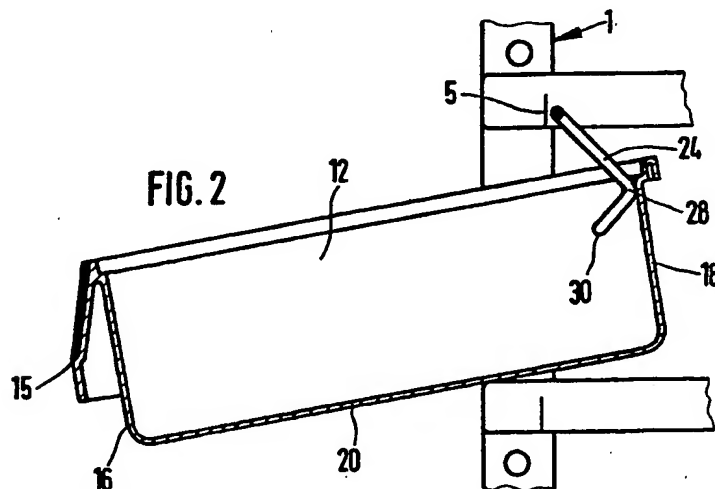
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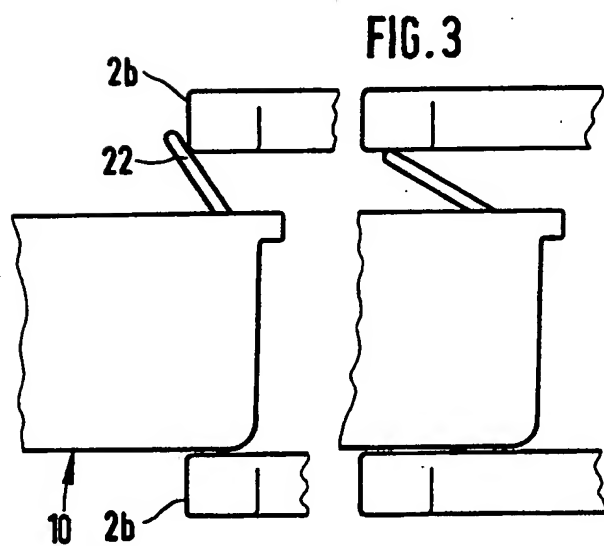
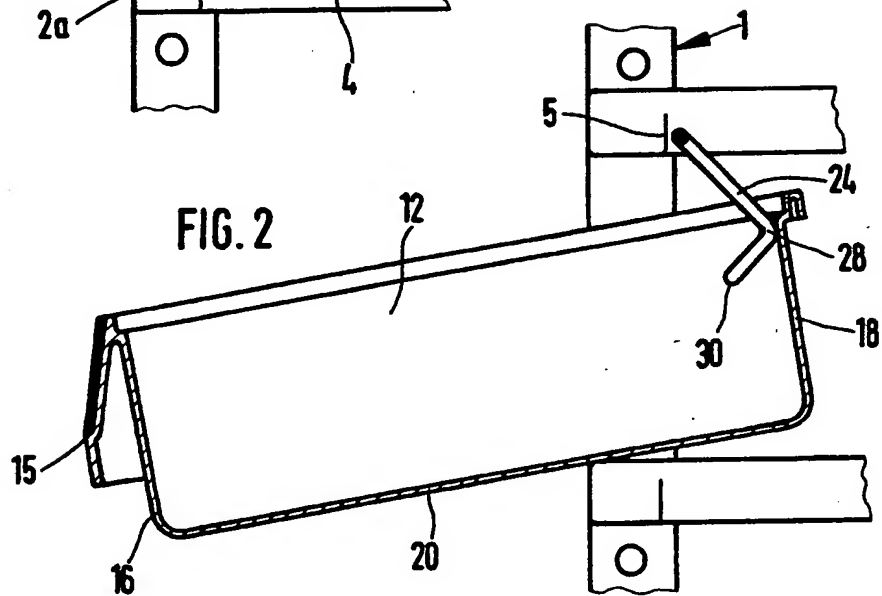
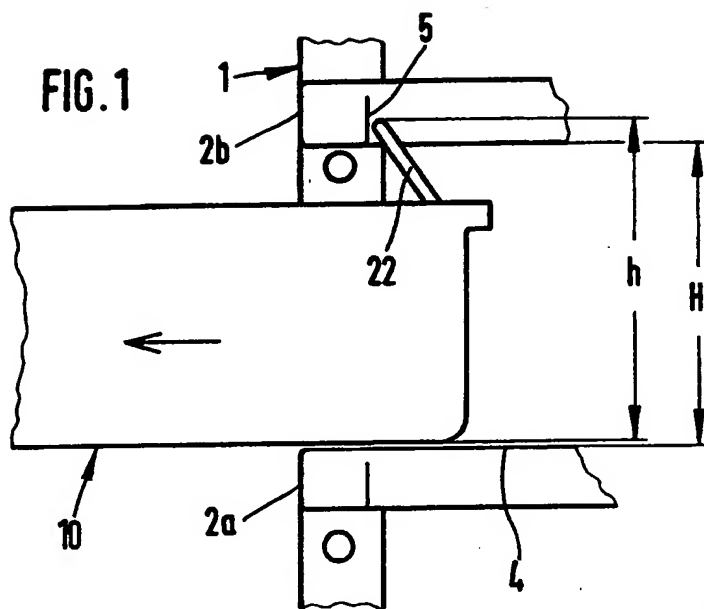
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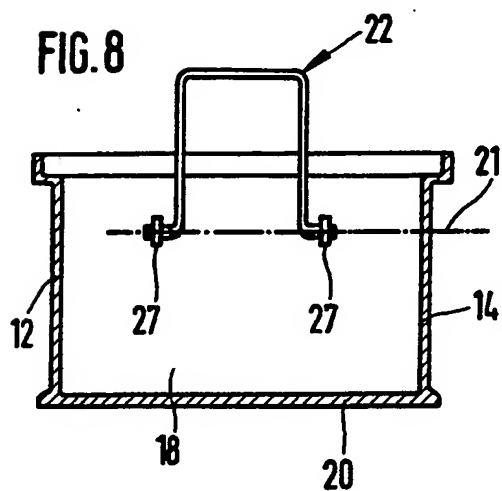
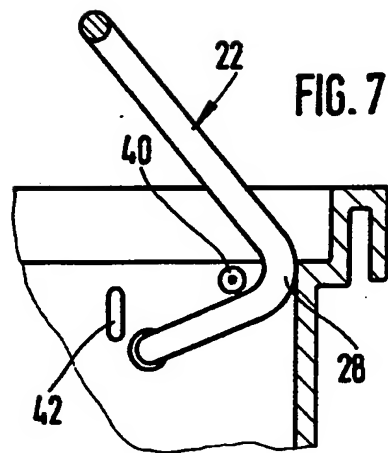
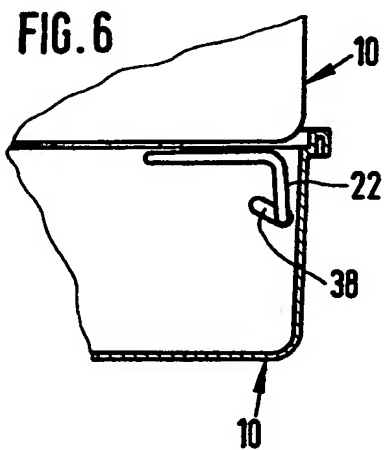
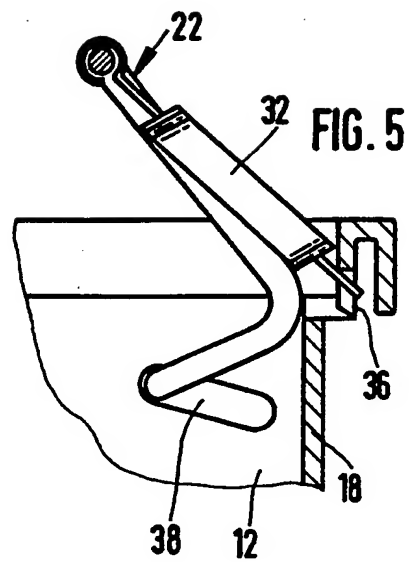
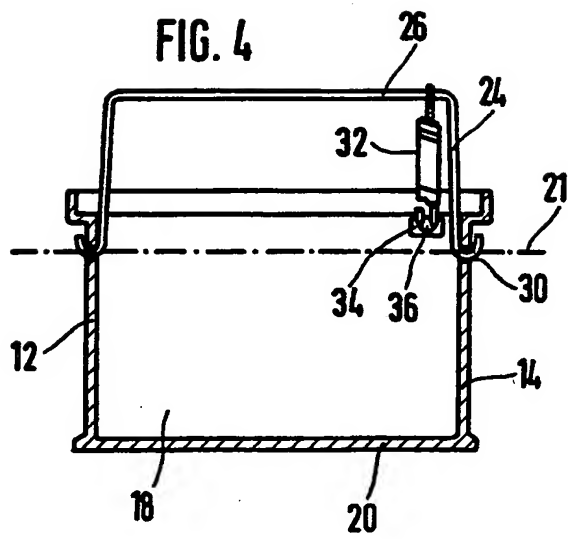
(54) A storage box which can be positioned between two shelves of a shelving unit

(57) A storage box adapted to be positioned between two shelves of a shelving unit (1) comprises a bottom (20), two side walls (12, 14), a front wall (16), and a rear wall (18). In its upper rear portion there is a retaining device which projects beyond the upper edges of the front wall (16) and beyond the two side walls (12, 14) in order to maintain the storage box in an access position in which it is partially withdrawn from the shelving unit (1) and in which it bears against the shelf which is above it. So that the storage box can, while occupying a minimum of space, be inserted into and removed from a shelf in a shelving unit and can be reliably held in the access position in the shelving unit (1), a pivoting element (22), not shown, is used as a retaining device and is articulated on the storage box to be pivotable about an axis parallel with the rear wall (18) and with the bottom (20). Provided on the storage box is an abutment (18) on which the pivoting element rests at least when the storage box is in the access position. In the position in which it bears against the abutment (18), the pivoting element is reliably supported and when this stable position no longer exists, then it is pivotable towards the front wall (16) of the storage box into a position which permits the storage box to be pushed into and removed from the shelves.



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A STORAGE BOX WHICH CAN BE POSITIONED
BETWEEN TWO SHELVES OF A SHELVING UNIT

The invention relates to a storage box according to the preamble to Patent Claim 1 and adapted to be positioned between two shelves of a shelving unit.

In the case of such a storage box, which is known from DE-GM 81 07 284, the retaining device is constituted by its rear wall, which is higher than the front wall and the side walls of the storage box. The raised rear wall makes it possible to pull out and tilt the storage box until it abuts an inner angled-over edge on the shelf above it, so that it projects from the shelf and is retained in an oblique attitude in the shelving unit for access, i.e. for taking items out of or filling the box. However, since the raised rear wall is rigid with the storage box, the shelves must be at a relatively considerable distance apart so that the storage box can be inserted between the two shelves of the shelving unit. Thus, it occupies considerable space on the shelving unit.

The construction on which the invention is based resides in so constructing the storage box of the type mentioned at the outset and with structurally simple means so that it can be placed in and removed from the shelving unit, in which it occupies only minimal space, while it can nonetheless be reliably held in the shelving unit when in the access position.

In the case of the storage box of the type mentioned at the outset, this problem is according to the invention resolved by the features indicated in the characterising part of Patent Claim 1.

The storage box according to the invention, by virtue of its design, occupies only a minimum of space in the shelving unit, because the clear height inside the push-in aperture is determined only by the height of the storage box when it is in the desired obliquely angled access position. The storage box can be easily pushed into and withdrawn from the shelves of the shelving unit, and in the latter case the pivoting element must be intentionally swung forwards. In the access position, the storage box is reliably held in the shelving unit by the pivoting element.

In the development of the storage box according to Claim 2, when the box is pushed into the shelving unit, the pivoting element automatically swings downwardly and positions itself behind an angled-over edge on the shelf which is above the storage box and automatically back into its upright abutting position. In order to remove the storage box from the shelving unit, the pivoting element only has to be swung out of the stable abutment position and into the interior of the storage box.

Accidental tipping of the pivoting element into the interior of the storage box is prevented by the provision of the stop stud according to Claim 3.

In the embodiment according to Claim 4, the centre of gravity of the pivoting element prevents its accidental tipping into the interior of the storage box but permits of such a pivoting movement if a corresponding moment is applied manually to the pivoting element.

Pivoting of the element in the direction of the interior of the storage box is limited by the measure disclosed by Claim 5.

The feature according to Claim 6 permits of a structurally simple design.

In the development according to Claim 7, the pivoting element can be narrow, while in that described in Claim 8 it may be wider.

The development of pivoting element according to Claim 9 as a pivoting bracket makes it possible for it to be used as a carrying handle after the storage box has been removed from the shelving unit.

In the embodiment according to Claim 10, a stable resting of the pivoting bracket against the rear wall is guaranteed, above all in the loaded position, i.e. in the access position.

The embodiment according to Claim 11 provides for the functions of the pivoting lever to be combined and for its mounting to be at an optimum height.

Examples of embodiment of the invention will be explained in greater detail hereinafter with reference to the accompanying drawings in which:

- Fig.1 is a side view of the rear part of a storage box which is pushed partially into a shelving unit;
- Fig.2 shows the storage box in Fig. 1 suspended in the shelving unit and inclined at an angle;
- Fig.3 diagrammatically shows the storage box being pushed into the shelving unit;
- Fig.4 is a cross-section through a first modified form of storage box retaining device;
- Fig.5 is a partial section from the side showing a second modified embodiment of storage box retaining device;

- Fig.6 diagrammatically shows stacked storage boxes;
Fig.7 is a partial section through a third modified embodiment of storage box retaining device, and
Fig.8 is a view of the inside of the rear wall of the storage box showing a fourth modified embodiment of retaining device.

The storage box 10 shown in Figs. 1 to 4 comprises a front wall 16, a rear wall 18, two parallel side walls 12, 14, all of which are of the same height, and a bottom 20. For removing the storage box 10 from a shelving unit 1 there is disposed on its front wall 16 a handle 15 on the front face of which there is a recess to accommodate a label.

In the upper rear portion of the side walls 12, 14 of the storage box 10 is an articulated pivoting bracket 22. The pivoting bracket 22 consists of two L-shaped side members 24 one end of which extends along the inside faces of the side walls 12 and 14, the said side members having bent-over hook-like portions which are supported in oppositely disposed apertures 30 in the side walls 12 and 14 so as to be pivotable about an axis 21 (Fig. 4), and of which the other ends are connected to each other by a transverse member 26.

A pivoting of the pivoting bracket 22 towards the rear wall 18 is limited in that the bend 28 in the L-shaped side parts 24 of the pivoting bracket 22 abuts the rear wall 18, as shown in Figs. 1 and 2. The overall height h of storage box 10 and pivoting bracket 22 is in this retained position greater than the height H of an insertion aperture between two superposed shelves 2a and 2b of the shelving unit 1. The height H of the insertion aperture is determined by a supporting surface 4 on the underlying shelf 2a and an angled-over edge 5 which at the front extends downwardly

from the shelf 2b above. The height of the space between the shelves 2a and 2b in the region behind the angled-over edge 5 is greater than the height H of the insertion aperture.

If, then, the storage box 10 is withdrawn from the shelving unit 1 in the direction indicated by the arrow in Fig. 1, the transverse member 26 of the pivoting bracket 22 abuts the angled-over edge 5 on the upper shelf 2b. Since further pivoting of the pivoting bracket 22 in the direction of the rear wall 18 is impossible due to abutment of the bent part 28 of the L-shaped side parts 24 against the rear wall 18, the storage box is reliably held in a slightly forwardly inclined position shown in Fig. 2 and regarded as the access position for removal from and filling of the storage box. Unintentional withdrawal so that the storage box 10 might fall to the ground is thus prevented.

In order to remove the storage box 10 from the shelving unit 1, the pivoting bracket 22 must be intentionally swung forwards into a position in which the overall height h of storage box 10 and pivoting bracket 22 is less than the height of the insertion aperture H between the two shelves 2a and 2b.

In the case of the embodiment of storage box 10 shown in Fig. 4, a draw spring 32 in the form of a coil spring or gas-filled spring is suspended at one end on the transverse member 26 of the pivoting bracket 22 and at the other on a bolt 36 provided in a recess 34 in the rear wall 18. The draw spring 32 is so pretensioned that in the unladen condition the pivoting bracket 22 is in its abutment position. The mounting of the draw spring 32 makes it possible to push the storage box 10 through the insertion aperture and into the shelving unit 1, the pivoting bracket

22 being pressed downwardly by the angled-over edge 5 and assuming an upright position again behind the angled-over edge 5, under the action of the draw spring 32 so that it regains its abutment position.

Outside the shelving unit 1, the pivoting bracket 22 can also be used as a carrying handle, additionally to the handle 15 provided on the front wall 16 of the storage box 10.

In the case of the modified embodiment shown in Figs. 5 and 6, the pivoting bracket 22 is articulated on the side walls 12, 14 in elongated guides 38 which extend obliquely downwardly towards the rear wall 18. Each elongated guide 38 is thereby so constructed that in its abutment position the pivoting bracket 22 is in the end of the elongated guide 38 which is towards the front wall 16 of the storage box 10 and in the position in which the pivoting bracket 22 is pivoted towards the interior of the storage box 10 for insertion into the shelving unit 1 or for removal from the shelving unit 1, it is in that end of the elongated guide 38 which is towards the rear wall 18.

By such an adaptation of the mounting of the pivoting bracket 22 to its position, short versions of the pivoting bracket 22 are possible. Furthermore, the storage boxes 10 can, as shown in Fig. 7, be conveniently stacked on one another, so ensuring good space utilisation.

In the case of the embodiment of storage box 10 shown in Fig. 7, there is on each side wall 12, 14 of the storage box 10 a stop stud 40 is so provided that it is within the bent part 28 when the pivoting lever 22 is in the abutment position. The pivoting bracket 22 can be moved between a locked position and a released position, wherein, in each

case elastic deformation of the pivoting bracket 22 allows it to negotiate the stop stud 40 in that the side part 24 of the bracket is pressed somewhat inwardly. When it is in its locked position, the pivoting bracket 22 is prevented from swinging downwards due to vibrations or under its own weight. In the released position, the pivoting bracket 22 can swing down until its side parts 24 abut a rib 42 provided on the side walls 12, 14.

In the case of the example of embodiment shown in Fig. 8, there are integrally moulded on the rear wall 18 of the storage box 10 two projections 27 which are at the same height and in which the ends of the pivoting bracket 22 are mounted to pivot about the axis 21. The transverse extension of the pivoting bracket 22 is thereby determined by the distance between the projections 27. By virtue of the fact that the pivoting bracket is disposed very close to the rear wall 18, it is possible to use substantially straight side parts instead of the L-shaped side parts 24 in Fig. 2.

Two sheets of drawings

DEAC-37274.7
16th January 1989

A STORAGE BOX WHICH CAN BE POSITIONED
BETWEEN TWO SHELVES OF A SHELVING UNIT

P a t e n t c l a i m s

1. A storage box which can be positioned between two shelves of a shelving unit and comprising a bottom, two side walls, a front wall, a rear wall and with, disposed in its upper rear portion, a retaining device which projects beyond the upper edges of the front wall and of the two side walls in order to retain the storage box on the shelf in a partially pulled-out access position in which it rests against the shelf above it, characterised
 - in that the retaining device is a pivotable element (22) articulated on the storage box (10) and pivotable about an axis (21) parallel with the rear wall (18) and the bottom (20),
 - and in that there is on the storage box (10) an abutment (18) against which the pivoting element (22) bears, at least when the storage box (10) is in the axis position,
 - and in that the pivoting element (22) is held in a stable fashion (40, 32) in the position in which it rests against the abutment (18),
 - and in that, when its stable position no longer obtains, the pivoting element (22) can be pivoted towards the front wall (16) of the storage box (10) into a position which allows the storage box (10) to be pushed in and out between the shelves.

2. A storage box according to Claim 1, characterised in that for stable supporting of the pivoting element (22) in the position in which it bears on the abutment (18), at least one draw spring (32) is provided, one end of which engages the transverse member (26) while the other end engages the rear wall (18).

3. A storage box according to Claim 1, characterised in that for stable supporting of the pivoting element (22) in the position in which it bears on the abutment (18), at least one stop stud (40) is provided on a side wall (12, 14).

4. A storage box according to Claim 1, characterised in that for stable supporting of the pivoting element (22) in the position in which it bears on the abutment (18), the pivoting element (22) is so constructed that in this position it is supported by its own weight.

5. A storage box according to Claim 3 or 4, characterised in that on the side wall (12, 14) an abutment rib (42) is provided which limits pivoting of the pivoting element (22) towards the front wall (16) of the storage box (10).

6. A storage box according to one of Claims 1 to 5, characterised in that the abutment is formed by the rear wall (18) of the storage box (10).

7. A storage box according to one of Claims 1 to 6, characterised in that the pivoting element is an angled bracket (22) articulated in projections (27) of the rear wall (18) of the storage box (10).

8. A storage box according to one of Claims 1 to 6, characterised in that the pivoting element is an angled bracket (22) articulated in the side walls (12, 14) of the storage box (10).

9. A storage box according to Claim 8, characterised in that the pivoting bracket (22) has two L-shaped side parts (24) with in each case a bend (28), one end of each being articulated on the inside face of the side walls (12, 14) while the other ends are connected by a transverse member (26) extending cross-wise over the interior of the storage box (10).

10. A storage box according to Claim 9, characterised in that to serve as an abutment, the rear wall (18) of the storage box (10) is associated with the bend (28) in the L-shaped side parts (12, 14).

11. A storage box according to Claim 9 or 10, characterised in that the pivoting bracket (22) is articulated in identical elongated guides (38) constructed on the side walls (12, 14) and which are inclined obliquely downwardly towards the rear wall (18).

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ABSTRACT:

CHG DATE=19990617 STATUS=O> A storage box adapted to be positioned between two shelves of a shelving unit (1) comprises a bottom (20), two side walls

(12, 14), a front wall (16), and a rear wall (18). In its upper rear portion there is a retaining device which projects beyond the upper edges of the front wall (16) and beyond the two side walls (12, 14) in order to maintain the storage box in an access position in which it is partially withdrawn from the shelving unit (1) and in which it bears against the shelf which is above it. So that the storage box can, while occupying a minimum of space, be inserted into and removed from a shelf in a shelving unit and can be reliably held in the access position in the shelving unit (1), a pivoting element (22), not shown, is used as a retaining device and is articulated on the storage box to be pivotable about an axis parallel with the rear wall (18) and with the bottom (20). Provided on the storage box is an abutment (18) on which the pivoting element rests at least when the storage box is in the access position. In the position in which it bears against the abutment (18), the pivoting element is reliably supported and when this stable position no longer exists, then it is pivotable towards the front wall (16) of the storage box into a position which permits the storage box to be pushed into and removed from the shelves. <IMAGE>